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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,048	08/29/2003	Pradeep K. Govil	1857.2010000	8531
26111	7590	12/29/2005	EXAMINER	
STERNE, KESSLER, GOLDSTEIN & FOX PLLC 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			DINH, JACK	
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/651,048	Applicant(s) GOVIL ET AL.	
	Examiner Jack Dinh	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1, 10, 11 and 29-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 10, 11, 29-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>DETAILED ACTION</u>                    |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 36 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 36, the claim has not provided any specific feature that would cause the reflecting surface of the respective reflecting device to become unparallel to the substrate. Therefore, the rejection below is based on the broadest interpretation.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 10, 29, 31-33, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al (US Patent 6,549,694) in view of Takeuchi et al. (US Patent 6,249,370), and further in view of Winkler et al. (US Patent 6,856,449).

Regarding claims 1, 31 and 32, Makino (figure 6B) is interpreted as disclosing a spatial light modulator that modulates an incident wavefront comprising reflective devices **109a** and **109b** that modulate portions of the incident wavefront. Makino does not disclose the claimed configuration of the actuating component underneath the reflective devices comprising the substrate, the actuator, and the first and second electrodes. Within the same field of endeavor, Takeuchi (figures 24 and 9) is interpreted as disclosing a actuating component underneath a reflective device, comprising a continuous solid and substantially rigid substrate **22**, and an actuator **14** comprising actuator elements **32** and first and second sets of electrodes **34a** and **34b**, wherein respective electrodes in the first set of electrodes are coupled to a first portion of respective ones of the actuator elements and are coupled to respective ones of the reflective devices, and wherein respective electrodes in the second set of electrodes are coupled to a second portion of the respective ones of the actuator elements and are coupled to the continuous solid and substantially rigid substrate. Makino in view of Takeuchi discloses all the claimed limitations except that the reflective devices are individually modulated to cause an interference pattern in a reflected wavefront, or the actuator elements are controlled to form an overall desired reflecting configuration. However, it is known in the display art that an interference pattern can be created by individually moving a single active reflective device next to a reference one. Within the same field of endeavor, Winkler is interpreted as disclosing this teaching (col. 7, lines

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60-67) or the actuator elements can be controlled to form an overall desired reflecting configuration (col. 8, lines 1-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the actuator, and the first and second electrodes for the purpose of creating the actuating component, and to modulate the reflective devices individually for the purpose of controlling different portions of the modulating array.

Regarding claim 10, Makino (figure 6B) is interpreted as further disclosing that the reflective devices form an overall curved shape.

Regarding claims 29 and 36, Takeuchi (figures 24 and 9) is interpreted as disclosing that the electrodes causes a material of the actuator elements to expand and contract in a piston-like motion (see figure 24) to move the respective reflective devices along a longitudinal axis of the actuator elements, wherein a reflecting surface of the respective reflective device remains parallel to a plane formed through a surface of the continuous solid and substantially rigid substrate. Takeuchi does not disclose the reflecting device being unparallel to the substrate. Within the same field of endeavor, Makino (figure 5) discloses such teaching. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to tilt the reflective devices unparallel to the substrate for the purpose of creating different interference patterns.

Regarding claim 33, Makino (figure 6B) is interpreted as further disclosing that the continuous solid and substantially rigid substrate provides a common reference plane for a

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reflecting surface of each of the reflective devices, such that the reflecting surface of the reflective devices are actuated with respect to each other to perform the modulating of the incident wavefront.

Regarding claim 35, Makino (figure 5) is interpreted as further disclosing that the electrode comprises a two-dimensional array of electrodes and each respective one of the two-dimensional array of electrodes is coupled to a second position of the respective ones of the actuator elements and is coupled to the substrate.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al (US Patent 6,549,694) in view of Takeuchi et al. (US Patent 6,249,370) and further in view of Winkler et al. (US Patent 6,856,449), as applied to claim 1, and further in view of Amm et al. (US Patent 6,639,722).

Regarding claim 11, Makino in view of Takeuchi in view of Winkler discloses all the claimed limitations except that the actuator elements are formed in varying heights and positions on the continuous solid and substantially rigid substrate, such that varying wavefront patterns are generated by light reflecting therefrom. Within the same field of endeavor, Amm is interpreted as disclosing this teaching (figures 3A and 3B). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the heights and positions of actuator elements for the purpose of different reflecting configurations.

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5. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al (US Patent 6,549,694) in view of Takeuchi et al. (US Patent 6,249,370) and further in view of Winkler et al. (US Patent 6,856,449), as applied in claim 29, in view of Frische et al. (US Patent 5,493,623).

Regarding claim 30, Makino in view of Takeuchi in view of Winkler discloses all the limitations as described above, except that the material of the actuator is a PZT. However, piezoelectric (PZT) type actuator is well-known in the art. Within the same field of endeavor, Frische et al. is interpreted as disclosing the teaching of a modulator application wherein electrical excitation to the electrodes causes the PZT material of the actuator elements to expand and contract (col. 7, lines 20-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time that the invention was made to use a PZT material, as taught by Frische et al., for the purpose of actuating the modulator.

6. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al (US Patent 6,549,694) in view of Takeuchi et al. (US Patent 6,249,370) and further in view of Winkler et al. (US Patent 6,856,449), as applied in claim 29, in view of Fujita (US Patent 6,002,154).

Regarding claim 34, Makino in view of Takeuchi in view of Winkler discloses all the limitations as described above, except for an insulating layer coupled to the substrate that dissipates heat from the respective electrodes in the second set of electrodes. Within the same field of endeavor, Fujita is interpreted as disclosing such teaching (col. 1, lines 55-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time that the

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invention was made to provide an insulating layer for the purpose of dissipating heat from the electrodes to avoid overheating the device.

### *Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is 571-272-2327. The examiner can normally be reached on M-F (9:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky L. Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack Dinh



Scott J. Sugarman  
Primary Examiner